

CROSSFIELD PRODUCTS CORPORATION

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SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

<u>TRADE NAME (AS LABELED):</u>	Mirathane MCU Clear, Part B
<u>CHEMICAL NAME/CLASS:</u>	Polyisocyanate Curative
<u>PRODUCT USE:</u>	Decking Topcoat Curative
<u>SUPPLIER/MANUFACTURER'S NAME:</u>	Crossfield Products Corp.
<u>ADDRESS: (West Coast):</u>	3000 E. Harcourt St. Rancho Dominguez, CA 90221 (Headquarters)
<u>ADDRESS: (East Coast):</u>	140 Valley Rd. Roselle Park, NJ 07204
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<u>DATE OF PREPARATION:</u>	October 15, 2019
<u>REVISION DATE:</u>	April 8, 2021

2. HAZARD(S) IDENTIFICATION



GHS Classification

Acute Toxicity (Inhalation) – Category 4
 Skin Irritation – Category 3
 Eye irritation – Category 2A
 Skin sensitization – Category 1
 Respiratory sensitizer (Solid/Liquid) – Category 1

Signal Word: (Danger)

Hazard Statements:

H316: Causes mild skin irritation
 H317: May cause an allergic skin reaction
 H319: Causes serious eye irritation
 H332: Harmful if inhaled
 H334: May cause allergy or asthma symptoms or breathing difficulties

Precautionary Statements:

P102: Keep out of reach of children
 P103: Read label before use.
 P261: Avoid breathing dust/fume/gas/mist/vapors/spray
 P264: Wash skin thoroughly after handling
 P271: Use only outdoors or in a well-ventilated area
 P272: Contaminated work clothing should not be allowed out of the workplace
 P280: Wear protective gloves/protective clothing/eye protection/face protection
 P284: In case of inadequate ventilation, wear respiratory protection
 P312: Call a POISON CENTER/doctor if you feel unwell.
 P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do, continue rinsing.
 P332+P313: If skin irritation occurs: Get medical advice/attention.
 P337+P313: If eye irritation persists: Get medical advice/attention.
 P342+P311: If experiencing respiratory symptoms: Call a POISON CENTER/doctor.

P302+P352: IF ON SKIN: Wash with plenty of water.

P333+P313: If skin irritation or a rash occurs: Get medical advice/attention.

P321: Specific treatment (see section 4 on this SDS)

P362+P364: Take of contaminated clothing. And wash it before reuse

P501: Dispose of contents/container in accordance with existing federal, state, and local environmental control laws.

HMIS-RATINGS (SCALE 0 – 4)

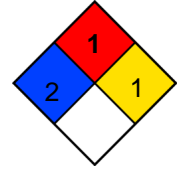
HEALTH	2*
FLAMMABILITY	1
REACTIVITY	1

Health = 2*

Fire = 1

Reactivity = 0

* Chronic Health Hazard

NFPA RATING


3. COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	%w/w	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV mg/m ³	STEL mg/m ³	PEL mg/m ³	STEL mg/m ³	IDLH mg/m ³	
Homopolymer of HDI	28182-81-2	60 - 100	NE	NE	NE	NE	NE	MFR TWA: 0.5 mg/m ³ MFR STEL: 1 mg/m ³ (15-min)
4-Methyl-1,3-Dioxolan-2-one	108-32-7	8 - 14	NE	NE	NE	NE	NE	
Hexamethylene-1,6- Diisocyanate	822-06-0	0.1 - 0.2	TWA 0.005 ppm	NE	NE	NE	NE	
Water and other ingredients. The other ingredients are each present in less than 1 percent concentration in this product.		Balance	The components present in the balance of this product do not contribute any significant, additional hazards. All hazard information pertinent to this product has been presented in the remaining sections of this Material Safety Data Sheet, per the requirements of Federal Occupational Safety and Health Hazard Communication Standard (29 CFR 1910.1200).					

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

4. FIRST-AID MEASURES

SKIN EXPOSURE: Take off contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Gently blot or brush away excess product. Wash with plenty of lukewarm, gently flowing water for a duration of 15-20 minutes. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before re-use or discard.

EYE EXPOSURE: Avoid direct contact. Wear chemical protective gloves, if necessary.

Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for 15-20 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. If eye irritation persists: Get medical advice/attention.

INHALATION: Remove source of exposure or move person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER/doctor. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by the POISON CENTER/doctor.

INGESTION: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor. If vomiting occurs naturally, lie on your side, in the recovery position.

IF exposed or concerned: Get medical advice/attention.

5. FIRE-FIGHTING MEASURES

FLASH POINT °C (method): 137 °C (278 °F)

AUTOIGNITION TEMPERATURE: NA

FLAMMABLE LIMITS (in air by volume, % butyl acetate):

Lower (LEL): NE

Upper (UEL): NE:

FIRE EXTINGUISHING MATERIALS:

Water Spray: NO

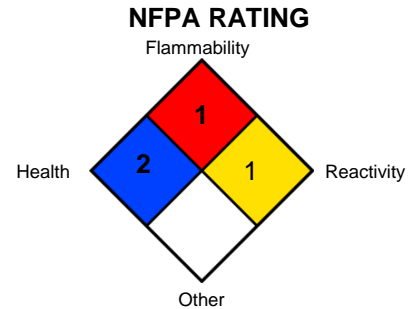
Carbon Dioxide: YES

Foam: YES

Dry Chemical: YES

Halon: YES

Other: Any "ABC" Class



Dry chemical, foam, carbon dioxide is recommended. Water spray is recommended to cool or protect exposed materials or structures. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Sand or earth may be used for small fires only.

Unsuitable Extinguishing Media:

If water is used, use very large quantities of cold water. The reaction between water and hot isocyanate may be vigorous.

Specific Hazards in Case of Fire:

Vapors may accumulate and travel to ignition sources distant from the handling site: flash fire can occur.

Excessive pressure or temperature may cause explosive rupture of containers.

Water contamination will produce carbon dioxide. Do not reseal contaminated containers as pressure buildup may rupture them.

Fire-fighting Procedures:

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Water may be ineffective but can be used to cool containers exposed to heat or flame. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid.

Special Protective Actions:

Wear NIOSH approved self-contained breathing apparatus in positive pressure mode with full-face piece. Boots, gloves (neoprene), goggles, and full protective clothing are also required.

Care should always be exercised in dust/mist areas.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedure:

ELIMATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

Do not touch or walk through spilled material.

Isolate hazard area and keep unnecessary people away. Remove all possible sources of ignition in the surrounding area. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

Recommended Equipment:

Appropriate dust or face mask to eliminate breath foam dust particulates.

Personal Precautions:

Avoid breathing vapors. Avoid contact with skin, eyes or clothing. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing.

Environmental Precautions:

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems and natural waterways by using sand, earth, or other appropriate barriers.

Methods and Materials for Containment and cleaning up:

Cover container, but do not seal, and remove from work area. Prepare a decontamination solution of 2.0% liquid detergent and 3-8% concentrated ammonium hydroxide in water (5-10% sodium carbonate may be substituted for the ammonium hydroxide). Follow the precautions on the suppliers' safety data sheets.

Treat the spill area with the decontamination solution, using about 10 parts of the solution for each part of the spill, and allow it to react for at least 15 minutes. Carbon dioxide will be evolved, leaving insoluble polyureas. Residues from spill cleanup, even when treated as described may continue to be regulated under provisions of RCRA and require storage and disposal as hazardous waste.

Slowly stir the isocyanate waste into the decontamination solution described above. Let stand for 48 hours, allowing the evolved carbon dioxide to vent away, residues may still be subject to RCRA storage and disposal requirements. Dispose of in compliance with all relevant local, state, and federal laws and regulations regarding treatment.

7. HANDLING and STORAGE

General:

Wash hands after use.

Do not get in eyes, on skin or on clothing.

Do not breathe vapors or mists.

Use good personal hygiene practices.

Eating, drinking and smoking in work areas is prohibited.

Ventilation Requirements:

Use only with adequate ventilation to control air contaminants to their exposure limits. The use of local ventilation is recommended to control emissions near the source.

Storage room Requirements:

Keep container(s) tightly closed and properly labeled. Store in cool, dry, well-ventilated areas away from heat, direct sunlight, strong oxidizers and any incompatibilities. Store in approved containers and protect against physical damage. Keep container securely sealed when not in use. Indoor storage should meet OSHA standards and appropriate fire codes. Containers that have been opened must be carefully resealed to prevent leakage. Empty containers retain residue and may be dangerous.

Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored.

Ground and bond containers and receiving equipment. Avoid static electricity by grounding.

Do not cut, drill, grind, weld, or perform similar operations on or near containers. Do not pressurize containers to empty them.

Ground all structures, transfer containers and equipment to conform to the national electrical code. Use procedure that prevent static electrical sparks. Static electricity may accumulate and create a fire hazard.

Bulk Containers: All tanks and pipelines which contain this material must be labeled. Perform routine maintenance on tanks or pipelines which contain this product. Report all leaks immediately to the proper personnel.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Eye Protection:

Wear eye protection with side shields or goggles. Wear indirect-vent, impact and splash resistant goggles when working with liquids. If additional protection is needed for entire face, use in combination with a face shield.

Skin Protection:

Use of gloves approved to relevant standard made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Stability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Use of an apron and over-boots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Launder soiled clothes or properly disposed of contaminated material, which cannot be decontaminated.

Depending on conditions of use, additional protection may be required such as apron, arm cover, or full body suit.

Wash contaminated clothing before re-wearing.

Respiratory Protection:

If airborne concentrations exceed or are expected to exceed the TLV, use MSHA/NIOSH approved positive pressure supplied pressure supplied air respiratory with a full face piece or an air supplied hood. For emergencies, use a positive pressure self-contained breathing apparatus. Air purifying (cartridge type) respirators are not approved for protection against isocyanates.

Appropriate engineering controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. See section 3 for limit values.



Vapor Respirator



Safety Glasses



Safety Gloves



Synthetic Apron

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): ND
SPECIFIC GRAVITY (water = 1): 1.16 (9.68 lb/gal)
SOLUBILITY IN WATER: reacts .
VAPOR PRESSURE, mm Hg @ 21 °C: Heavier than air
ODOR: ND
LOG WATER/OIL DISTRIBUTION COEFFICIENT: Not available.
APPEARANCE AND COLOR: Clear to hazy amber liquid
HOW TO DETECT THIS SUBSTANCE (warning properties): ND
VOC Regulatory 0.00 lb/gal

EVAPORATION RATE (n-BuAc=1): Slower than ether
MELTING/FREEZING POINT: Not established.
BOILING POINT: 203°C
pH: Not Established

10. STABILITY and REACTIVITY

STABILITY: Stable at standard temperature and pressure.
DECOMPOSITION PRODUCTS: Thermal decomposition products of this solution can include carbon monoxide, carbon dioxide, and other toxic or irritating compounds, including oxides of nitrogen, hydrogen cyanide and hexamethylene diisocyanate. Combustion may produce isocyanate vapors.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product will react with any material containing active hydrogens, such as water, alcohol, ammonia, amines, alkalis and acids, the reaction with water is slow under 50°C, but is accelerated at higher temperature and in the presence of alkalis, tertiary amines, and metal compounds. Some reaction can be violent. Material can react with strong oxidizing agents.
HAZARDOUS POLYMERIZATION: Avoid heating above 400 °F.(204 °C).
CONDITIONS TO AVOID: Avoid exposure or contact to extreme temperatures and incompatible chemicals, sparks or flames.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Additional toxicology information for components greater than 1 percent in concentration is provided below.

Homopolymer of Hexamethylene Diisocyanate (28182-81-2)

Acute Oral LD₅₀: > 2,500 mg/kg (rat, female) (OECD Test Guideline 423)

Acute Dermal LD₅₀: >2,000 mg/kg (rabbit, male/female)

Acute Dermal LD₅₀: >2,000 mg/kg (rat, male/female) (OECD Test Guideline 402)

Acute Inhalation LC₅₀ (rat): 0.39 – 0.543 mg/l, 4hrs, dust/mist (rat, male/female) (OECD Test Guideline 403)

The test atmosphere generated in the animal study is not representative of workplace environments, how the substance is placed on the market, and how it can reasonably be expected to be used. Therefore the test result cannot be directly applied for the purpose of assessing hazard. Based on expert judgment and the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

Skin Irritation – Slight irritant (rabbit) Exposure Time: 4 h, (OECD Test Guideline 404)

Eye Irritation – slight irritant (rabbit) (OECD Test Guideline 405)

Sensitization – Skin sensitization (local lymph node assay (LLNA)): positive (Mouse) (OECD Test guideline 429)

Skin sensitization according to Magnusson/Kligmann (maximizing test): positive (Guinea pig) (OECD Test Guideline 406)

Respiratory sensitization – No pulmonary sensitization observed in animal tests. No pulmonary sensitization potential was observed in guinea pigs after either intradermal or inhalative induction with polyisocyanate based on hexamethylene diisocyanate.

Repeated Dose Toxicity – 90 d, Inhalative: NOAEL: 3.3, (rat, male/female) 6 hours a day, 5 days a week.

Irritation to lungs and nasal cavity. Evidence of damage to organs other than the organs of respiration was not found.

Mutagenicity – Generic Toxicity in Vitro: Salmonella/microsome test (Ames Test): No indication of mutagenic effects. (Metabolic Activation: with/without)

Chromosome aberration test in vitro: negative (Chinese hamster V79 cell line, Metabolic Activation: with/without)

Point mutation in mammalian cells (HPRT test)

Hexamethylene-1,6-Diisocyanate (822-06-0)

Acute Oral Toxicity - LD₅₀ (rat, male) : 746 mg/kg (OECD Test Guideline 401)

Acute Dermal Toxicity - LD₅₀ (rat, male/female) : >7000 mg/kg (OECD Test Guideline 402)

Acute Inhalation Toxicity - LC₅₀ (rat, male/female): 0.124 mg/l, 4 (OECD Test Guideline 403)

Skin irritation (Rabbit) Corrosive (OECD Test Guideline 404)

Eye irritation (Rabbit) Corrosive (OECD Test Guideline 405)

Sensitization-Dermal (guinea pig) Sensitizer (Maximization Test)

Sensitization-Dermal (Human) Sensitizer (Case report)

Sensitization –Respiratory (guinea pig) Sensitizer

Repeated Dose Toxicity – 2 years, inhalation: NOAEL: 0.005 ppm, (rat, male/female, 6 hrs/day, 5 days/week)
Irritation to lungs and nasal cavity.

Mutagenicity – Genetic Toxicity in Vitro: Salmonella/microsome test (Ames test): negative (Salmonella typhimurium, Metabolic Activation: with/without)

Point mutation in mammalian cells (HPRT test): negative (Metabolic Activation: with/without)

Genetic Toxicity in Vivo – Micronucleus test: negative (Mouse, male/female, Inhalative)

Carcinogenicity – rat, male/female, Inhalative, 2 yrs, 6 hours/day, 5 days/week. Did not show carcinogenic effects in animal experiments.

Toxicity to Reproduction/Fertility – Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test. Inhalative, 6 hours/day 7 days/week, (rat, male/female) NOAEL (F2): 0.3 ppm Fertility and developmental toxicity test did not reveal any effect on reproduction.

Developmental Toxicity/Teratogenicity – rat, female, Inhalative, 6 hours/day (Exposure duration: day 0 – 19 of gestation), NOAEL (teratogenicity): 0.3 pp., NOAEL (maternal): 0.005 ppm Did not show teratogenic effects in animal experiments.

Neurological Effects – Rats exposed by inhalation, 6 hours/day, for approximately 3 weeks, to concentrations as high as 0.3 ppm showed no neurobehavioral effects or damage to nerve tissues.

Carcinogenicity – No carcinogenic substances as defined by IARC, NTP and/or OSHA

Propylene Carbonate: (108-32-7)

Acute Oral Toxicity: LD50: >5,000 mg/kg (Rat)
(OECD Test Guideline 401)

Acute Inhalation Toxicity: No data available
Acute Dermal Toxicity: LD50: >2,000 mg/kg (Rabbit)
(OECD Test Guideline 402)

Skin corrosion/irritation: No skin irritation (Rabbit) (Draize Test)
Serious eye damage/eye irritation: Irritating to eyes (Rabbit) (OECD Test Guideline 405)

Respiratory or skin sensitization: Patch test on human volunteers did not demonstrate sensitization properties.

Germ cell mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Animal testing did not show any mutagenic effects

Reproductive toxicity

Did not show teratogenic effects in animal experiments.

Animal testing did not show any effects on fertility

Specific target organ toxicity – single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ toxicity – repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Additional Information:

RTECS: FF965000

Other isocyanates have been shown to produce dermal and respiratory sensitization in several species (guinea pigs, mice, rabbits, dogs). In addition, there is some evidence to suggest that cross-sensitization between different types of diisocyanates may occur.

SUSPECTED CANCER AGENT: The major components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA in concentrations > 0.1 %; and are therefore not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product is severely irritating and corrosive to contaminated tissue.

SENSITIZATION TO THE PRODUCT: Prolonged or repeated skin contact can result in the development of rashes, and other allergy-like symptoms.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not reported to produce mutagenic effects in humans, however, a component may be mutagenic – the data is inconclusive..

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans.

Reproductive Toxicity: This product is not reported to cause reproductive effects in humans.

*A **mutagen** is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance which interferes in any way with the reproductive process.*

BIOLOGICAL EXPOSURE INDICES: Currently there are no Biological Exposure Indices (BEIs) associated with the components of this product.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE Skin disorders can be aggravated by over-exposure to this product. Inhalation of this products mists may aggravate respiratory conditions.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate over-exposure to this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

Homopolymer of Hexamethylene Diisocyanate (28182-81-2)

Biodegradation: Aerobic, 1%, Exposure Time: 28 days, not readily biodegradable

Bioaccumulation 3.2 BCF An accumulation in aquatic organisms is not to be expected
 367.7 BCF An accumulation in aquatic organisms is not to be expected. Studies of hydrolysis products.

Acute and Prolonged Toxicity to Fish:

LC50: > 100 mg/l, Danio rerio (Zebra fish), 96 hrs

Acute Toxicity to Aquatic Invertebrates:

EC50: >100 mg/l, Daphnia magna(Water flea), 48 hrs

Toxicity to Aquatic Plants:

ErC50: >1,000 mg/l, Scenedesmus subspicatus (Green algae), 72 hrs

Toxicity to Microorganisms:

EC50: 3,828 mg/l (Activated sludge microorganisms), 3 hrs

Hexamethylene-1,6-Diisocyanate (822-06-0):

Biodegradation - Aerobic, 42%, Exposure Time: 28 days, not readily biodegradable

Bioaccumulation – value calculated, 57.6 BCF

Acute and Prolonged Toxicity to Fish - LC0: >= 82.8 mg/l, Danio rerio (Zebra fish, 96 hrs)

Acute Toxicity to Aquatic Invertebrates - EC0: >=89.1 mg/l, Daphnia magna(Water flea, 48 hrs)

Toxicity to Aquatic Plants - ErC50: >77.4 mg/l, Desmodesmus subspicatus(Green algae, 72 hrs)

Toxicity to Microorganisms - EC50: 842 mg/l (Activated sludge microorganisms, 3 hrs)

Propylene Carbonate: (108-32-7)

Toxicity to fish:	Semi-static test LC50 – Cyprinus carpio (carp) – >1,000 mg/l (96 h) (OECD Test Guideline 203)
Toxicity to daphnia and other Aquatic invertebrates	Static test EC50 – Daphnia magna (Water flea) – >1,000 mg/l (48 h) (OECD Test Guideline 202)
Toxicity to Algae:	EC50 – Desmodesmus subspicatus (green algae) – >900 mg/l (72 h) (OECD Test Guideline 201)
Toxicity to bacteria:	EC10 – Pseudomonas putida - 7,400 mg/l (16 h) (DIN 38 412 Part 8)
Persistence and degradability	No Data
Bioaccumulative potential	No data
Mobility in soil	No data
Results of PBT and vPvB assessment:	PBT/vPvB assessment not available as chemical safety assessment not required/not conducted
Other adverse effects	No data available

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. It may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

14. TRANSPORTATION INFORMATION

TRANSPORTATION (DOT): Not Regulated

IATA SHIPPING DATA: Not-Regulated

IMDG SHIPPING DATA: Not-Regulated

MARINE POLLUTANT: This product does not contain any components which are designated by the Department of Transportation to be Marine Pollutants. (49 CFR 172.101, Appendix B).

Note: The latest DOT information is provided, please verify all DOT information as it subject to change without notice.

15. REGULATORY INFORMATION

CAS	Chemical Name	% By Weight	Regulation List
28182-81-2	Homopolymer Of HDI	60 - 100	DSL, SARA 312, TSCA
108-32-7	Propylene Carbonate	8 - 14	DSL, SARA 312, TSCA
822-06-0	Hexamethylene Disocyanate	0.1 - 0.2	SARA 313, DSL, CERCLA, HAPS, SARA 312, VHAPS, VOC, TSCA

SARA Threshold Planning Quantity: Not applicable.

DOT REGULATED COMPONENT (RQ): Hexamethylene-1,6-Diisocyanate
Reportable Quantity– 45,000 lbs

CERCLA REPORTABLE QUANTITY (RQ): Hexamethylene-1,6-Diisocyanate - 100 lbs

OTHER FEDERAL REGULATIONS: Not applicable.

STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: No

California - Permissible Exposure Limits for Chemical Contaminants: No

Florida - Substance List: No.

Illinois - Toxic Substance List: No

Kansas - Section 302/313 List: No

Massachusetts - Right to Know Substance List: Homopolymer of Hexamethylene Diisocyanate.

Minnesota - List of Hazardous Substances: No

Missouri - Employer Information/Toxic Substance List: , No

New Jersey - Right to Know Hazardous Substance List: Hexamethylene-1,6-Diisocyanate.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: No

Pennsylvania - Hazardous Substance List: : Homopolymer of Hexamethylene Diisocyanate.

Rhode Island - Hazardous Substance List: No

Texas - Hazardous Substance List: No

West Virginia Substance List: No

Wisconsin - Toxic and Hazardous Substances: No

CALIFORNIA PROPOSITION 65: Not listed

Canadian DSL: All components of this product are on the Canadian DSL.

WHMIS 1988 Classification:

D1A - Poisonous and infectious material - Immediate and serious effects - Very toxic

D2A - Poisonous and infectious material - Other effects - Very toxic

D2B - Poisonous and infectious material - Other effects – Toxic

E – Corrosive material



WHMIS 1988 Health Effects Criteria Met by this Chemical:

D1A - TDG class 6.1 packing group II - very toxic - immediate

D2A - Respiratory tract sensitization - very toxic - other

D2B - Eye irritation - toxic - other

D2B - Skin irritation - toxic - other

D2B - Skin Sensitization - toxic – other

E – Corrosive to skin

WHMIS 1988 Ingredient Disclosure List:

Not included. Meets criteria for disclosure at 0.1% or greater.

16. OTHER INFORMATION

PREPARED BY:

BILL BEACH

CROSSFIELD PRODUCTS CORP,

THIS INFORMATION IS DRAWN FROM RECOGNIZED SOURCES BELIEVED TO BE RELIABLE. CROSSFIELD PRODUCTS CORP. MAKES NO GUARANTEES NOR ASSUMES ANY LIABILITY IN CONNECTION WITH THIS INFORMATION. THE USER SHOULD BE AWARE OF CHANGING TECHNOLOGY, RESEARCH, REGULATIONS AND ANALYTICAL PROCEDURES THAT MAY REQUIRE CHANGES HEREIN. THE ABOVE DATA IS SUPPLIED UPON THE CONDITION THAT PERSONS WILL EVALUATE THIS INFORMATION AND THEN DETERMINE ITS SUITABILITY FOR THEIR USE.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour **Time Weighted Average (TWA)**, the 15-minute **Short Term Exposure Limit**, and the instantaneous **Ceiling Level**. Skin adsorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called Recommended Exposure Levels (**RELs**). When no exposure guidelines are established, an entry of **NE** is made for reference.

HMIS HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime over-exposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime over-exposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the **National Fire Protection Association (NFPA)**. Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause death. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Other acronyms used are: **Superfund Amendments and Reauthorization Act (SARA)**; the **Toxic Substance Control Act (TSCA)**; Marine Pollutant status according to the **DOT**; California's Safe Drinking Water Act (**Proposition 65**); the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the materials package label.